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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,821	09/05/2003	Michael Paul Tankard	K315.131.101	9414

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EXAMINER	
MCCLOUD, RENATA D	

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/656,821	TANKARD, MICHAEL PAUL	
	Examiner	Art Unit	
	Renata McCloud	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young et al (US 5838127) in view of Starkie et al (US6329785).

Claim 1: Young et al teach a circuit comprising a plurality of switches (Fig. 2:148,150,152,154) connecting a phase winding (138) to a supply (P), the switches comprising a first set (148/154) and a second set (150/152) for connecting the phase winding to the supply, the first and second sets of switches adapted to supply current to the phase winding and returning current to the supply (It has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchinson, 69 USPQ 138.), one switch of each set being connected between the supply and a first end of the phase winding and another switch of each set being connected between the supply and a second end of the phase winding, the switches of the first and second sets conducting current in both a first and a second direction (col. 5:48-50 MOSFETS are bidirectional). They do not teach the switches of the first set being rated higher than the switches of the second set. Starkie et al teach switches of the first set (25), the first set of switches for supplying/conducting current (col. 5:27-35) being rated higher than the switches of the second set (col. 2:64-66), the second set of switches for returning current (col. 5:27-35). It would have been obvious to one having ordinary skill in the art

at the time the invention was made to modify the apparatus taught by Young et al to rate the switches as taught by Starkie et al in order to provide overcurrent protection.

Claim 2: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 2, Young et al teach the circuit is arranged during a motoring (forward) mode to supply current to the phase windings via the first set and provide a path for returning current to the supply via the second set, and in a generator (reverse) mode to supply current to the phase winding via the second set and return current to the supply via the first set (Col. 2:63-67; 6:18-33; 8:1-12)

Claims 3 and 13: Young et al and Starkie et al teach the limitations of claims 1 and 12. Referring to claims 3 and 13, Young et al teach the direction of the current in the phase winding in the motor mode (forward) is opposite the direction in the generator mode (Col. 2:63-67; 6:18-33; 8:1-12: reverse).

Claim 4: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 4, Starkie et al teach the switches (25,23) are capable of operating as a diode (col.1: 51-56). Young et al also teach that the switches are capable of operating as a diode (col. 5:48-50 MOSFETS). Also, as it has been held that the recitation that and element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchinson, 69 USPQ 138).

Claim 5: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 5, Starkie et al teach a switch has an inherent integral reverse diode (col.1: 51-56).

Claims 6, 11: Young et al and Starkie et al teach the limitations of claim 1. Referring to claims 6,7,11, Starkie et al teach the switches are MOSFETs (col. 5:27-30).

Claim 7: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 7, they teach the claimed invention except for enhancement layer MOSFETs. It would have been an obvious matter of design choice to use enhancement layer MOSFETs, since applicant

has not disclosed that using enhancement layer MOSFETs solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with MOSFETs.

Claim 8: Young et al and Starkie et al teach the limitations of claim 1. Referring to claims 6,7,11, Starkie et al there are four switches (23,25) and the first set (25) comprises two switches (25) rated higher than the remaining two forming a second set (col. 2:64-66).

Claim 9: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 9, Young et al teach a first switch (148) connected between a first end of the winding (138) and a first voltage rail (P+), a second switch (152) connected between the first end of the winding (138) and a second voltage rail (P-), a third switch (150) between a second end of the winding (138) and the first voltage rail (P+), and a fourth switch (154) connected between the second end and the second rail the first (148) and fourth (154) switches forming a set.

Claim 10: Young et al and Starkie et al teach the limitations of claim 9. Referring to claim 10, Young et al teach the second (150) and third switches (152) form the second set.

Claims 12 and 15: Young et al teach a SR motor comprising a plurality of rotor poles, a stator having a plurality of stator poles (col. 4:48-66) and a circuit comprising a plurality of switches (Fig. 2: 148,150,152,154) connecting a phase winding (138) to a supply (P), the switches comprising a first set (148/154) and a second set (152/150) for supplying current to the phase winding and returning current to the supply, the circuit is arranged during a motoring mode to supply current to the phase windings via the first set and provide a path for returning current to the supply via the second set, and in a generator mode to supply current to the phase winding via the second set and return current to the supply via the first set (Col. 2:63-67; 6:18-33; 8:1-12). They do not teach the switches of the first set being rated higher than the switches of the second set. Starkie et al teach switches of the first set (25), the first set of

switches for supplying/conducting current (col. 5:27-35) being rated higher than the switches of the second set (col. 2:64-66), the second set of switches for returning current (col. 5:27-35). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Young et al to rate the switches as taught by Starkie et al in order to provide overcurrent protection.

Claim 14: Young et al teach an SR motor comprising a plurality of rotor poles, a stator having a plurality of stator poles (col. 4:48-66) and a circuit comprising a plurality of switches (Fig. 2: 148,150,152,154) connecting a phase winding (138) to a supply (P), the switches comprising a first set (148/154) and a second set (152/150) for supplying current to the phase winding and returning current to the supply, the circuit is arranged during a motoring mode to supply current to the phase windings via the first set and provide a path for returning current to the supply via the second set, and in a generator mode to supply current to the phase winding via the second set and return current to the supply via the first set (Col. 2:63-67; 6:18-33; 8:1-12, 18:37-19:8). `They do not teach the switches of the first set being rated higher than the switches of the second set. Starkie et al teach switches of the first set (25), the first set of switches for supplying/conducting current (col. 5:27-35) being rated higher than the switches of the second set (col. 2:64-66), the second set of switches for returning current (col. 5:27-35). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Young et al to rate the switches as taught by Starkie et al in order to provide overcurrent protection.

Response to Arguments

2. Applicant's arguments filed 12/12/2005 have been fully considered but they are not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that it would not be obvious to combine the references in order to provide overcurrent protection, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both Starkie and Young et al teach a pwm switching circuit for supplying and returning current to a winding.

In response to applicant's argument that Young et al do not teach a generating mode because Young et al teach away from generating bemf, Young et al teach the motor switching

from a forward (motoring) mode to a reversing (generating) mode (col.18: 37-19:8) In the reversing mode, the motor is powered with a current in phase with the bemf (col. 18:37-52). Young only prevents the bemf from occurring when an undesirable condition such as overvoltage or undervoltage occurs (see col 8:49-51). This disabling of the bemf is to prevent the motor from being energized, thus stopping the motor. If no bemf was generated, the motor would not work, as in, it would be in a shutdown state (col. 8:58-62).

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renata McCloud whose telephone number is (571) 272-2069. The examiner can normally be reached on Mon.- Fri. from 8 am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2800 ext. 4. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renata McCloud
Examiner
Art Unit 2837

RDM

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